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Universities, Ancient and Modern.

Read before the Birkenhead Literary and Scientific Society at the opening of its Fifty-first Session, on Monday, the 7th October, 1907.

BY THE PRESIDENT,

BENJAMIN MOORE, M.A., D.Sc.

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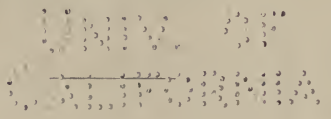

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UNIV. OF
CALIFORNIA

UNIVERSITIES, ANCIENT AND MODERN.

By BENJAMIN MOORE, M.A., D.Sc.

THE ancient Universities, both of this country and of the continent of Europe, have reached their position and functions in relationship to the thought and intellectual life of the present day, by a long process of evolution, lasting since the mediaeval times in which most of them began to exist.

Without a continued adaptation to environment no institution of civilized man, however powerful, can outlast the passage of centuries. As knowledge increases all our institutions must either become transformed by a gradual process into harmony with new conditions, or be swept away by something in the nature of a revolution to make way for a new departure.

Whenever the continued working of free enquiring minds over social, intellectual, or political problems has accumulated sufficient store of discoveries to show that any human doctrine, policy, or theory, is erroneous and stands in the path of progress, then there must come a renunciation sooner or later, and a new rendering must be put upon what is old to blend it into harmony with what is new.

In such a renunciation, or rather re-modelling, it is usually only the worthless dross which disappears, and out of the fire of criticism there appears something nobler and better than before. For a time, it may seem to an unprepared and unreceptive age that the new work is rank heresy, destroying ruthlessly long loved and cherished doctrines; but in a few years general progress demonstrates that the old eternal essential facts are shining forth like gems in a more appropriate setting and forming a grander jewel with the added gems that patient work has unearthed and polished and placed alongside of them.

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The longevity and worth of any institution of learning hence depends upon the ease with which it can escape from the fetters of false authority forged in the past, hold fast to what is essential and eternal, abandon all that is useless and antiquated, and attach and assimilate the discoveries which new thought and experiment bring forward either from within itself or from the outer world.

In order to make the matter stand boldly out by stating it in one concise sentence—the one necessary and sufficient condition for continued growth and vitality in a University is absolute freedom. Perfect liberty of intellectual life in all the forms of activity of the human mind fostered within its walls. Freedom to think and work with unbiassed mind and with philosophic calm, and to teach without fear the results of such untrammelled study, to its students and to the world.

The fight for intellectual freedom has been waged by the master minds of the Universities, by the leaders of thought within them, through the many long centuries since first they began their careers in the darkness of the middle ages. In fact it was the struggle for intellectual freedom in the eleventh and twelfth centuries, the restless searching for truth, for more light and knowledge, and the demand for free access to knowledge for all comers which led to the first informal commencements of the earliest Universities.

But, it may be urged, surely at the present day all Universities do enjoy such freedom, they are nowhere threatened any longer as to what they shall study, teach or investigate by king, pope, or prelate, they flourish in an intellectual age, they are endowed and fostered alike by government and municipality, and by the munificence of the wealthy citizen.

What more is there to be desired, in what sense is there any lack of academic freedom?

While every true lover of intellectual development must rejoice at this more widespread and universal patronage and endowment of learning and scientific enquiry which has become characteristic of our time, those who quietly reflect upon the causes of it must realize that the welcome and ever increasing

stream of support requires to be directed and controlled so that it may be utilized to the full advantage.

The world has seen no age at which scientific investigation and development were more encouraged and subsidised than the present time, yet, there never was an age more purely materialistic, or more inclined to love knowledge exclusively for the creature comforts that increased knowledge brings in its train.

This narrow utilitarian spirit is as dangerous to academic freedom in the present time as was narrow ecclesiasticism in earlier times, and it behoves modern Universities to fight as hard against modern commercialism as the ancient Universities had to battle with the monasticism of the middle ages.

In no sense does this belittle the service which science has rendered and will render to commerce and industry; but it must be remembered that scientific service, as Universities may be expected to yield it, is intended not for one nation but for the whole world.

No narrow selfish spirit can confine scientific advance to one community, or one country, the whole world must benefit from it, and no University in its broader and higher work can serve one community exclusively, but must shed its influence and the light of its achievements to all mankind. Nor is there anything to be deplored in this communism in the advancement of knowledge, for while we cannot, if we would, confine the advances we make for our own exclusive benefit, we on the other hand reap the results of the knowledge acquired by the research of all other civilised nations.

The true emulation which ought to exist between communities and nations in the acquisition of knowledge is therefore not a selfish and secretive one, but one with far higher and more altruistic motives as to which shall be first and most powerful to advance the cause of a common humanity, striving to pierce forward into the unknown land of discovery.

Finally, as will be pointed out in detail when we come to consider the work of the modern University, this continual grasping for immediate results of applied science ultimately

defeats even its own narrow purpose, for nature never yields her choicest secrets to him who approaches with a mercenary spirit. All the great practical applications arise subsequently to discoveries made by those who study for the pure love of knowledge in fields where apparently, at first sight, no practical application can accrue.

A discovery which when first made is beautiful and important only to the initiated and to the general world seems trivial and unimportant, nay, even a waste of time and patience and a misapplication of University funds or public endowments; becomes in the course of time the basis, and the only possible basis, of a far reaching practical application in which the whole community, and the whole world shares.

Instance after instance of this order of events could be quoted from all fields of intellectual labour, but the world seems slow to learn that even from its own utilitarian standpoint it pays to subsidize organized study upon a broad basis by men who dream not of applications, and are only curious to know more of what still remains unknown.

Let it not however be thought that one word of what has been said is intended to depreciate the value of scientific application for utilitarian purposes, or even to minimize the work which ought also to be undertaken in Universities towards such application. The work of applying scientific knowledge to specific problems which face humanity lies well within the sphere of University labour, and often requires the same type of mind exactly as that which first discovered the general principles. Also the labour of practical application is often as truly scientific as the pursuit of abstract truth. The point is that enquiry must be absolutely free to travel where the spirit and the indications lead without stopping to enter into questions of utility, either immediate or remote.

The point of view of the scientific or philosophical enquirer in arts, science or letters must be that all knowledge is beautiful and useful both in itself and as a path to further knowledge. In this faith he must trustingly and unhesitatingly

go forward, and in this faith must the world support him and follow in his path.

It is only by such a pure philosophic faith and creed that the realms of ignorance can be conquered and intellectual wealth increased, and it is only by unswerving loyalty to this doctrine in their teaching and research that Universities and other institutions of learning can carry out their high destinies, and lead forward the intellectual forces of the world.

Hence, while any government or municipality which endows and supports a University has a full right to demand that such University shall supply the intellectual needs of the community, that it shall disseminate the common knowledge of the world of science, arts and letters, and make common the knowledge which it itself is acquiring, that it shall teach and train the youth of the community for the learned professions and for public life and service, and that by every means in its power it shall broaden and deepen the whole intellectual life of the community. Still at the same time, the community should in its own best and broadest interests and in those of the whole civilized world, remember that the University should not be overweighted with task work, that its whole duty does not lie in undergraduate teaching, however important and essential that duty may be both to community and University, but that ample provision and endowment must be made, if the University is to be worthy of the name, for higher teaching in the region of research, and that here perfect freedom of development must be allowed, for originality cannot be trained and bound but must be allowed to grow freely or it will never flourish.

And now having attempted to establish that the fundamental principle in the life and constitution of the ideal University is perfect intellectual freedom of thought, enquiry and teaching, we may come to examine more in detail the work and functions of a University in modern times.

It may however be both interesting, and of assistance to us in mapping out the functions of our modern University, to

glance for a few moments at the causes which first led to the establishment of Universities, and at their earlier history.

The ancient seats of learning in Greece and Italy in classical times, although they possessed little organization of a University type, were nevertheless nearer to the ideal pointed out above of what a University ought to be, than any institutions which have since arisen, in possessing the priceless boon of academic freedom in all its purity.

The lack of state or municipal organization and endowment, were made good by the munificent patronage of rulers, statesmen, and emperors who were themselves often either professors or students. The classical literature, philosophy and fine art, which, now long ancient, have still remained a prototype for successive generations of civilized man, then lay before the student in pristine freshness or were actually in the making before his eyes.

The splendid example and stimulus of the old world's greatest philosophers and thinkers actually constructing and creating their immortal works, played directly upon the student's mind as he met them day by day, came into actual touch with them mind to mind, and caught their inspiration and enthusiasm in living breathing force.

This touch of living fire made the student himself, if he had the potentialities within him, a worker, a thinker, a philosopher.

This, and nothing less than this, is ideal University teaching, and this it is which is sadly missed in the weight of book-learning of the present age.

Books are the accessories and tools of enquiry, and learning, and as such in modern days are essential to progress in specialized branches of learning. But the first essential point for the student to grasp is that they are only his tools, and the first object of his teacher ought to be to teach him to use his tools with a master workman's knowledge. The intelligence to use these tools is what a University education should cultivate. Similarly, in such branches of science as are taught in laboratories, the laboratory with its equipment, and

costly provision for maintenance and materials, are all necessary accessories, the scenery of the drama to be enacted there, but, unless ripe master-minds which can distinguish substance from shadow are there to teach, and intelligent minds of pupils, capable of taking development, are there to learn, then vain is the costly laboratory and all its equipment.

To return from this digression, the student in the Athenian age of learning in its halcyon days, learnt by talking and disputation with his teacher; from Plato "in the olive groves of Academe;" or Aristotle in the walks of the Lyceum; from Epicurus reclining in his beautiful garden; or Zeno, the Stoic, in the shade of his porch. There was none of that immeasurable distance of dignity and reserve which too often in modern days separates professor and student, but mind rubbed against mind, and there was that friendship and freedom of intellect which brightened the student and kept the professor bright.

Books there were in plenty, preserved with a religious care in the large libraries which gradually accumulated around those ancient halls of learning, but these were for reference only, the art of printing had not showered its blessings and curses on the world, and as far as University education was concerned, cheap text books, with cheaper contents, had not yet introduced their plague of dry rot between professor and student.

The same love of freedom which characterized the mode of teaching, is reflected in the style of building of these ancient eastern schools.

The olive groves of Academe formed a beautiful pleasaunce laid out with terraces and fountains, the gift of an early Attic ruler who worshipped philosophy and learning for their own dear sake.

Here in the open, or in the shade of the porches or trees the recitations of poetry, disputations and philosophic discussions took place, in the clear elastic air and bright sunshine of Greece.

In Alexandria, somewhere in the third century B.C., another magnificent temple of Greek learning was established by the Ptolemies.

The seat of this institution which, in all save form was a University, was termed the Museum, or home of the Muses. It formed part of the royal quarter of the city, and included an arcade or cloister furnished with recesses and seats. There was also a large building containing a common hall in which the Scholars who were members of the Museum met for their meals. Here were taught, not only the sons of kings and patricians, but all with a love for learning and knowledge, from all ends of the earth were welcome to its walls. The professors were drawn not only from Athens but from all the civilized regions bordering on the Mediterranean, the first requisite for an academic post being that the man should be great and famous in the subject he professed.

One distinctive feature of this famed Alexandrian School, is that more attention was given to exact science, mathematics, astronomy and physics, and that it saw the dawnings of medicine, and also of chemistry and natural science as daughter sciences of the healing art.

The surviving remnants of the scientific work of this great school gave the stimulus a thousand years later to the first of all our more modern Universities—the ancient Medical School of Salerno.

It is interesting to note that amongst the last of the great men of the Alexandrian School as it waned to its decadence was Theon, the mathematician and philosopher, the father of Hypatia. Writing of the days of this ancient school, Kingsley says:—"School after school, they had all walked and taught "and sung there, beneath the spreading planes and chestnuts, "figs and palm trees. The place seemed fragrant with all the "riches of Greek thought and song."

Turning to Italy, we find at Rome early in the opening century of the Christian era the commencements of the formation of an institution of learning worthy of the name of University.

The wealth and civilization of the capital of the great Roman Empire naturally drew towards it men of learning from all parts of the world, although for centuries still Athens

and Alexandria, remained, like our Oxford and Cambridge, the great University towns. We find it recorded that Vespasian, in completing his Temple of Peace, erected a basilica in which the learned might carry on their teachings and their disputations.

This institution was later extended by the Emperor Hadrian and came to be known in his time as the Atheneum. It was subsequently enriched by further endowments from successive Emperors. There were in its most flourishing times ten professors or teachers in Greek and Latin grammar: three each for Greek and Latin rhetoric; three in Philosophy, and four in Roman Law.

In addition to this metropolitan University there were schools of a similar type in all the important towns of the Roman Empire, founded chiefly by the Emperors Vespasian and Hadrian.

At all these classical Universities above mentioned, the chief subjects of intellectual activity were such as would now find their place in an Arts Faculty of a modern University, and such as did indeed about ten centuries later form the entire Arts Faculty of the earlier days of the mediaeval Universities.

The subjects of study were divided into seven groups, and these were afterwards placed under two headings, the trivium and quadrivium. The trivium which was first studied, usually for about three years, comprised, grammar (Greek and Latin), rhetoric and dialectic; the quadrivium included music, arithmetic, geometry, and astronomy.

These terms were very elastic in their application and had different meanings at the different schools. Thus, grammar, occasionally meant the subject alone in its modern meaning, more frequently it included literature and criticism; dialectic in some cases included logic, metaphysics, and ethics, while in others metaphysics was excluded.

With the exception of rhetoric and law, which were mainly intended as a preparatory to public life and the legal profession, the studies were designed in the interests of general culture and with no professional objective. But, as stated above, in Alexandria science and medicine were cultivated, and Rome had a wide-spread reputation as a school of law.

In Greece, and in Alexandria, the students appear to have been of every age, from the callow youth of fifteen to the grey-beard coming, in retirement from the battles of the world, to the intellectual battles which then often raged in the lecture spaces. In Rome there appears to have held sway a rigid disciplinarianism, resembling that of the German Empire at the present day. Here the students entered at fourteen and left at nineteen unless they remained to pursue their studies in the special subject of law.

The last of the greater academies to be founded prior to the decadence of learning, and one coming at a later date than those already mentioned, was established in Constantinople in the fourth century. The work was commenced by Constantine and later completed by Theodosius and Valentinian. This school was similar in its endowments and curriculum to that of Rome. In it classical learning flourished alongside of patristic literature down to the eighth century and after a period of decadence it was re-established in the ninth century, when chairs of geometry and astronomy were endowed.

It is impossible in such a short sketch as this to enter adequately upon the reasons which have been assigned as leading to the gradual eclipse of learning and education which became almost total about the end of the sixth century and lasted in almost unrelieved blackness until about the twelfth century; as also, conversely, into those causes which heralded the dawn of new light at that early renaissance period which formed the ever brightening daybreak before the glorious sunrise of the fourteenth and fifteenth centuries. Much has been written on both subjects, and the views are as diverse as the authors have been numerous. Many may have been the secondary influences which hastened or retarded, but in both cases the decadence or renaissance of learning and of intellectual vigour was but one of the many symptoms of organic disease or recovery in the whole body politic.

The great Roman Empire had become unwieldy in its bulk, and internally weak, and was waning away. The physical,

moral and intellectual stamina of former days had gone, wealth had accumulated and men decayed; the blight of slavery was everywhere amongst the people; wealth and poverty in hideous contrast lived side by side; corruption and venality usurped the seats of justice and equity in the courts, and the rulers were dissolute and incompetent.

It was indeed high time that this effete civilization without strength for further progress in arts, science or literature should be swept away by the barbaric invasions, which at the same time that they ruthlessly swept away ancient institutions, and destroyed free intellectual life for some centuries, gave at least as a recompense a new rough and barbaric strength to the ruling peoples.

New intellectual life developed but slowly in this almost virgin soil, and it was only after centuries of vegetation of a lower order that cosmos arose out of chaos.

The first steps are the slowest in social and intellectual evolution just as in any process of evolution in the organic world, and the reaction only gathers velocity as it goes.

It required the long night, the long fallow period of the middle ages, to produce the great outburst of intellectual, social and political advance which came to the world eight or nine centuries later.

Then the struggle of knowledge against ignorance, of freedom against slavery or restraint, brought forth and established not only the communities (or "Universities") of searchers after intellectual truth, but those other great communities of men of common work or thought which were necessary to give the strength to fight successfully for freedom.

The great and powerful guilds formed for the protection and freedom of the craftsmen, and for securing municipal life and freedom of government for the great and wealthy cities; the first beginnings of the struggles for constitutional government, for parliaments, for social, political and religious liberty, began in common with Universities and University life, and by the operation of the same common causes.

In fact, the first Universities founded in mediaeval times were guilds or communities formed in the cause, and to protect the interests and privileges, of learning and of free intellectual life. In their earliest form and in the banding of the students together to form what were called "nations," they were constituted similarly to the municipal and trade guilds existing alongside of them. The colleges which in some cases arose in the Universities were a further carrying on of this idea, and endowments given to them for poor scholars bear a curious resemblance to similar endowments given to municipal companies and guilds for maintenance of poor apprentices. Nor from the point of view of intellectual training and development does any great gulf divide them from the other guilds, for one object of these was to improve the art and craft which the guild represented. It may be added that much of the artistic development in applied arts and crafts arose from the fostering influence of the guild or city company. Indeed in many cases the University community was also a practical craft as in the medical school of Salerno which formed the first University. Similarly in the case of our own ancient colleges of physicians and of surgeons we have really examples of incorporated guilds.

In this connection it is well to point out that the derivation of the word University has often been wrongly given as meaning an institution in which *all* branches of learning are represented. This error has probably naturally arisen from the diversity of work and studies of our Universities in modern times; but the word "*Universitas*" as it occurred in old documents constituting or referring to Universities simply meant a community, and has the same significance as "*collegium*" where the meaning is more obvious. Either word meant what would now be legally covered by the term corporation. In earlier times the word never occurs absolutely but in combination with a description of the "Universitas" or community referred to, and it is just as frequently used in reference to guilds or municipalities.

The real distinctive name used for a University in mediaeval documents is *studium generale*, and it is significant and of importance to us that this did not denote a place of general study, but a place for general students, a place where all students whether ecclesiastical or secular were free to meet for free study.

Thus once more it was the desire for intellectual freedom which led to the foundation of Universities.

So far from being places of general study the three earliest mediaeval Universities were places at which only one special study was carried on and for a long time division into faculties, and the pursuit of diverse studies under one corporation did not take place. Thus taking them in their historical order, Salerno was a great University or *studium generale* of medicine, Bologna a great law-school, and Paris a great school of divinity and philosophy.

There is scarcely time for me to indicate in barest outline the forces which led to the formation of these early Universities, still less to deal with the interesting topic of their earlier developments.

Since it bears so closely in upon my general thesis, that the ideal University must be a school of free thought, enquiry, and teaching, some passing reference must be made to the channels in which education and intellectual life, such as existed, ran in the middle ages in pre-University days.

We have seen that the seeds of death had already been sown in the early classical learning by the general intellectual and moral decadence of the later days of the Roman Empire.

Literary study of the old classics had become mere pedantry, the soul of learning had gone and but its outward form remained; the thoughts of the old masters were not appreciated but instead trick or irregularity of phrase, or peculiarity of construction occupied the attention, words took the place of actions, and study had no longer its due effect in moulding and developing the life and after work of the student.

The first revival from this intellectual and moral apathy came in the early Christian faith, but unfortunately it came not

in the pure and glorious form contained in the life and teaching of our Lord but weighed down and debased by human additions and misconceptions.

These errors of human invention bred of ignorance and false traditions increased with process of time and led to the confinement and fettering in monasteries of mental life and to the thick darkness, both moral, intellectual and spiritual, of the middle ages.

Let me not be misunderstood here, the beautiful inspiration, teaching, and example of the life of Christ was the great beacon of those dark times, it transformed the whole spirit of the age, and was a source of both moral and intellectual strength ; but held up before the people in its own purity how much more might it have wrought than when obscured by human error, misconception and tradition.

Movements too, such as the monastic one, begun at first with the purest and highest motives, by pious men desirous of living holy lives, and supposed to be enjoined by the Christian faith, led in the hands of others to the direst abuses. Of these abuses that which here concerns us most was the fettering of secular as well as religious learning within their walls.

A narrow asceticism sprung up which was neither in sympathy with true Christian doctrine, nor with general culture and intellectual development.

The Church placed its influence in the main against secular learning, except as a means to an end, and that end was the development of religion as the Church of that time understood it.

Even the greatest men of the time were caught by this narrow bigoted spirit. Thus St. Jerome, one of the most learned of his time, condemned the study of the classics except for pious uses, and rejoiced over the growing neglect of Plato and Aristotle. There is the tale of his supposed vision in which he dreamt that he was dead and being dragged before the tribunal of the Judge of all men. Falling on his face to hide himself from the brightness of the vision he heard an awful voice demanding " Who art thou." On his answering

"A Christian" he heard with trembling the terrible reply—"It is false; thou art no Christian; thou art a Ciceronian; where the treasure is, there is the heart also." From that hour, we are told, he renounced the study of the ancient classics.

Similarly, St. Augustine admits, and regrets, his early fondness for Virgil, lamenting the tears that he had shed over the death of Dido and recalling with penitence his boyish delight in the story of the wooden horse and the burning of Troy.

These examples show the spirit of the times and it is not surprising that at the Fourth Council of Carthage the reading of secular books even by the bishops was formally prohibited. Nor is it any wonder that a century later one of the most learned men of the time writes—"Young men no longer study, professors no longer have pupils, knowledge languishes and dies."

The result of this suppression of the pursuit of secular studies for their own sake, was that all education, higher and lower, passed under the domination of the Church and was conducted chiefly in the monasteries, or by Monks in episcopal or cathedral schools.

At first only candidates for the Church service were taught, but later others were admitted and were taught under strict ecclesiastical surveillance, as much as was thought to be good for the salvation of their souls.

It was all however a means to this great end, "they were taught to read, that they might study the Bible and understand the services; to write, that they might copy the sacred books and the psalter; to understand music, that they might give with due effect the Ambrosian chant."

This bondage of the mind, though it lasted for centuries, could not however, with the constitution that the human mind possesses, last for ever. As time elapsed from the downfall of paganism, and the old mythology was no longer a serious power, the monks themselves became more liberal and the forces of civilization began to reassert themselves. Throughout the darkest days, a few in the monasteries had not been able

to subdue their natural and insatiate love for knowledge and the classics had been read and copied in secret, the love of classical knowledge became less of a crime, and we find at length that classical learning begins again to be honoured.

Thus we find the learned Cassiodorus retiring from a high position corresponding to that of Prime Minister to the great Gothic King Theodoric about the middle of the sixth century, to found a monastery, the monks of which he enjoins to cultivate learning as a means to the better knowledge of the scriptures, and recommends the study of the classics. He spent large sums on the purchase of manuscripts from Northern Africa and other parts of the world, and encouraged his monks to copy them with care. The monastery was erected at Scyllacium, his birthplace, which he describes in the following beautiful sentence :—

"She hangs like a cluster of grapes upon the hills, basking "in the brightness of the sun all the day long, yet cooled by "the breezes from the sea, and looking at her leisure on the "labours of the husbandmen in the cornfields, the vineyards, "and the olive groves around her."

A revival of learning on a wider scale, and for its own sake as well as that of religion, was attempted by the great emperor Charlemagne towards the close of the eighth century.

Charlemagne began at the root of the matter by taking steps for the reform of the education of the priesthood and monks, and afterwards founded many schools throughout his kingdom and reformed those already existing.

The most famous of these was the Palatine or Palace School founded in the palace at Aix-la-Chapelle for members of the court and their children, and open to all desirous of obtaining education.

An interesting legend describes the foundation of this great school.

Alcuin of York, a famous scholar of the time, had been already invited from England and held the high post of Minister of Public Instruction and Worship.

One day the people in the market-place were astonished to hear two men, in the company of some English traders, calling

out " If any one wants knowledge let him come to us and get it ; for we have it to sell." The people thought the men mad, but the incident having reached the Monarch's ears he sent for the men and asked them whether they really had knowledge to sell, and what they asked for it. They replied that they had and that its price was " a place to teach it, pupils to learn it, and needful food and raiment." The men turned out to be two Irish scholars, Claud Clement and John Melrose from the monastery of Melrose in Scotland.

Charlemagne accepted their services, established the school in his palace under Clement and Alcuin, and taking Melrose with him to his Italian Wars settled him as head of a school at Pavia.

The influence of this stimulus was great, especially to lay study; and the encouragement given to learning grew and probably hastened the foundation of Universities many years later.

Somewhat similar efforts were made by Alfred the Great in our own country about half a century later.

Some idea of the state of learning in England may be gathered from this king's statement that he knew no priest south of the Thames who understood the Latin prayers which he used. The monks in the Benedictine monasteries had however undoubtedly some genuine knowledge of Latin.

Alfred also instituted a Palace School, and urged his people where circumstances in any way admitted of it to give their children at least the elements of learning.

The repeated invasions of the Danes after Alfred's death soon however ended for the time this promising revival in England.

We may pass rapidly over the two succeeding centuries that intervened before the Universities began to arise. In spite of the efforts of Charlemagne knowledge cherished in a few centres did not become general, for the times soon became troublous times, and wars and rumours of wars filled the whole world. The Danes were invading England, the Normans descending upon Europe, and in the East the Saracens were threatening all Christendom. In the midst of war's alarms,

king, baron and knight cared little for letters or learning, and slew one another sufficiently well without them.

In the very midst of this barbaric feudalism there arose among the hardy fighting men a force more powerful for civilization than all the monastic schools, and which gave new ideals and inspired new purposes. This new influence was the order of chivalry, commencing in the tenth century, flourishing in its strength in the eleventh, twelfth and thirteenth centuries, and leaving behind it when the quixotism of its outward trappings disappeared, much of what there still remains of the ideal and beautiful in more modern civilization and social life.

The true principles of Christianity, grafted upon the brave military spirit of the age, produced secular orders of knights, the essential spirit of whose creed was a love of honour above all things, and their conception of honour included valour of the highest type, truthfulness, love of justice, respect for woman, and courtesy to all men. Not every knight, alas, in the days of chivalry lived up to these high ideals, but the ideals were established and changed the spirit of the age, and out of the ideals, in later times, arose institutions of permanent form.

The Church fortunately recognized the value of the new order and instead of opposing it enlisted it in its cause. Thus began the Crusades in which, though much blood and treasure were lost, men learned by travel and by the association of different nations in a common cause.

The civilians also, especially in the great cities, perhaps all the better on account of the absence of many of the fighting men in the East, began to bestir themselves and to form those Guilds to which allusion has been already made. Corporations defining their internal government and conferring freedom and privilege against the encroachment of feudal barons were given to the great cities by various kings and rulers. Within the cities too the guilds and communities for the protection of common interests arose in commerce, in industry, and, most interesting to us, in education. The necessity for higher schools was recognized and these were provided in several centres.

The impulse to mental activity which appeared and led to the foundation of the Universities was hence part of a wide-spread movement which also initiated the order of chivalry, the crusades, the incorporation of cities and the organization of guilds or companies. At the bottom of all this organization and union lay the desire for freedom to be gained by the strength of united action.

The Universities did not owe their origin to the Church although later in their history they had their privileges and powers to teach confirmed to them by papal Bulls.

But the work of inception was begun and continued in freedom. Free teaching and free learning lay deep at the very heart of them.

There were men who had studied and had something to teach, and there were other men anxious to learn, these factors formed the materials for the first Universities, and following examples before their eyes in the civic world they united themselves, teachers and students with equal rights and privileges at first, into guilds, communities, colleges or Universities.

It was chiefly for protection against the power of local ecclesiasticism, and to confer general validity throughout the civilized world upon the degrees obtained at these early Universities, that the papal assistance and papal or kingly charters were required, but long before formal permission or assistance had been claimed from either king or pope these very earliest Universities were in actual existence and doing the work of teaching and investigating.

It is for this reason that it becomes almost impossible to trace with accuracy and place a date upon the earliest commencement of the first Universities in mediaeval times, their existence is usually dated from some important book which has withstood the ravages of time written by some teacher within their community.

The chief privileges conferred by the papal Bull was the *jus ubique docendi*, which meant that a master or doctor trained at one of the Universities possessing this privilege, had the right to equal standing at any other University and of teaching there. Although it did not invariably follow in later days that

this right was always mutually respected by the Universities, still it was a most desirable privilege. From its first appearance in the papal Bulls, and almost invariable occurrence there, it came in time to be considered a privilege which could only be given by a papal Bull, and hence practically all the mediaeval Universities were founded, or later sought for and obtained a papal Bull of incorporation. Thus Paris and Bologna more than a century after their foundation were recognized by Bulls of Nicholas IV. But Oxford and Pavia which had not been founded by Bull and had not sought the *jus ubique docendi* were too powerful to be ignored as Universities, and hence were by the Jurists of the time recognized as *studia generalia* or Universities "*by custom.*"

The first of the *studia generalia* was Salerno near Naples, here even in 528 A.D. a Benedictine Monastery was established, and among other studies medicine engaged the attention of the monks, and medical monks gave advice and medicine gratis. The books studied and expounded were Hippocrates and Galen.

The first great stimulus to new work at Salerno was given about the middle of the eleventh century by Constantinus Africanus, who had acquired his first stock of medical lore in Babylon and Carthage. His life and travels, real or legendary, are as fascinating as a romance.

The course of medical study at Salerno in A.D. 1137 for a *licencia medendi* like that of modern days lasted for five years and was preceded by a three years course in Arts. All those desirous of practising had to pass an examination at which royal assessors were present. Though the University gave the licence it was given under the authority of the Crown. The penalty for practising without a licence was imprisonment and confiscation of goods. The sale of drugs was not regulated till some years later. Even for permission to practise the then barber's art of surgery, it was required by the Crown that there should be one year's attendance on lecturers who taught anatomy and chirurgy.

The medical instruction given to our students to-day is of course as different from the curriculum of Salerno, as light

from darkness, but it is questionable if we have improved on the regulations for study.

The second University founded was that of Bologna, where the chief subject was civil law, to which subsequently ecclesiastical or canon law was added. Here the revival was led by Werner, or Irnerius, to whom we chiefly owe the restoration of the Roman law and its institution as a subject of universal study.

At Bologna there were instituted the divisions of the students into communities or nations, according to the locality or nature of their residence.

These nations were the prototype of the German Students' corps which mean so much to German Student life at the present day, and also probably of the so-called secret communities or class societies of the American Universities, one of their most valuable institutions. These nations led to the separate law of the Universities which exempted the students from direct civic power and placed them under that of the University. We have survivals of this in Oxford and Cambridge, as also in the German Universities, where the University has its separate prison, and students are brought for judgment on misdemeanours before the University and not the civil authorities.

The great University of Paris was the third to arise, and here the strongest and originally the only Faculty was that of Theology.

The great progenitor of the Paris University, although not a professor in it, was the famous Abelard. It was the spirit of liberty and originality in theological discussion and disputation introduced at Paris by this thinker which led to the great free theological schools. The questionings of accepted doctrines so instituted, and especially the long discussion between the realists and nominalists over the question of transubstantiation which here arose, paved the way for the partial acceptance of the position that the doctrines of the Church were subjects for reasonable discussion and criticism and could be debated upon, at least by theologians in Universities assembled. Here lay the first

germ of the great reformation which was later to come, and it came as a gift from that intellectual freedom which the *studium generale* first openly encouraged.

It must not be supposed however that the Universities long remained free from sacerdotal authority. In their beginnings they were no menace to authority for they possessed no power, but as time went on and their power upon men increased, some action had to be taken, and reason was hence carefully put under the control of clerical authority, armed by supposed revelation which was only human interpretation.

As Huxley puts it, "theological dicta were to the thinkers "of those days, that which the axioms and definitions of "Euclid are to the geometers of these. The business of the "philosophers of the middle ages was to deduce from the data "furnished by the theologians conclusions in accordance with "ecclesiastical decrees. They were allowed the high privilege "of showing by logical process, how and why that which "the Church said was true, must be true. And if their "demonstrations fell short of or exceeded this limit, the "Church was maternally ready to check their aberrations, if "need be, by the help of the secular arm.

"Between the two our ancestors were furnished with a "compact and complete criticism of life. They were told how "the world began and how it would end; they learned that "all material existence was but a base and insignificant blot "upon the fair face of the spiritual world, and that nature was, "to all intents and purposes, the playground of the devil; they "learned that the earth is the centre of the visible universe, "and that man is the cynosure of things terrestrial."

From such an altitude of the Mediaeval Church and the free intellectual movement of the Universities, there naturally arose a fierce and long continued battle. In various University centres expulsions came, and tests were instituted; often and often truth was submerged for the time, and error prevailed; there was palpable weakness only too often on the part of Universities and their high authorities, but in the end right and freedom of mind prevailed, and to-day, although it is

recent history and as it were almost within our memory, all religious tests have disappeared from Universities both for teacher and student, and thought in any domain of human knowledge is free and unconfined.

This position has not been attained without many a brave struggle, and knowledge has often suffered by suppression, and by the cruel oppression of the noblest of our fellowmen.

Let us not forget this history, and as our freeborn right let us ever maintain our University and intellectual liberty alike against open foe or insidious enemy.

The consideration of the history of University education has occupied a good deal of our time and led us somewhat far afield, but we have been able to learn certain useful lessons by the way, from past failures and successes which may be useful to us now in constructive work upon our ideal modern University, and teach us what should be avoided and what encouraged.

The work of the University may be taken for convenience under two headings, viz. (1) teaching, and the dissemination of knowledge, and (2) enquiry or research, that is the making of new knowledge.

Although I choose to treat of the matter in this order, I would not however have it thought that they can be separated in the work of any University.

In proper University work they are on the contrary inextricably blended and should form one harmonious and perfect whole.

No University can be regarded in my opinion as ideal, or even as living and healthy in which they do not co-exist together. Nor can one be regarded as of less importance than the other, but the two as co-equal and mutually subservient and auxiliary to each other.

True teaching and fruitful research are the closest allies and have always gone together, and they are the enemies of both who would pit them against each other, or depreciate one for the intended glorification of the other.

A University which does not possess a strong corps of undergraduate students, the pick of whom can be stimulated to continue on to post-graduate and research work, may flourish for a time in an exotic way by means of research work done by graduates from other Universities, but it will decay in the end from lack of native talent. Further, students trained by good teaching within its own walls early acquire the *genus loci* and are better fitted to carry out research with their former teachers than those imported or arriving from without.

On the other hand if the school (one can scarce call it a University) does no research work, but merely trains students in undergraduate work, however excellent its examination results, it will soon be known as an institution which is sterile and in which true knowledge does not flourish.

For how can teachers keep up to date in their work and preserve enthusiasm for their teaching if they are not in actual contact with their subject and helping to extend its borders.

Professors who do no research may be living textbooks of their subject in the lecture rooms, and if they are orators may be most interesting textbooks; but they are nothing more than textbooks which have a trick of turning into old editions, and there is wanting all the fire and enthusiasm that the real worker excites in his hearers.

I am well aware at the same time that I say this, that the great investigator is often a very poor lecturer especially to large classes of junior students; but this brings me to combat the popular fallacy that the main work of the University professor is carried out in the lecture room in a modern University.

The lecture as a vehicle of instruction is wofully shrunken from its former grandeur.

In those subjects of University study which bear a practical relationship to the material natural world such as the chemical, physical, and biological sciences, and their applied aspects in medicine, engineering, industries, and commerce, the main and substantial work is done in the practical laboratory or workshop of the University, and here the teacher comes in individual touch with the student and teaches him by practical application.

For this work it is the master-worker that is needed, not the orator or lecturer.

Nor in the departments which deal with man in his relationship to his fellow-man, with mind more remotely connected with material things, are affairs so widely different in the University work of the present day.

I speak with diffidence upon this subject, which lies outside my own province, but I am of opinion that in the majority of Arts subjects, such for example as the language and literature of ancient and modern nations, in comparative philology, in archeology, in all history, in education, and pedagogy, in architecture and applied Art, in mental and moral philosophy and psychology, in all humanistic studies in short, the places and the manner of that instruction which is most real and important, correspond more closely to the modern laboratory of the science side and to the practical instruction given there, than to the old lecture theatre with its blackboard and bare benches which might in earlier days have served in turn as the home of all, and in which all were equally badly and unpractically taught.

Each of these subjects possesses in effect a laboratory known as its class library, in which there are ready to the student's and teacher's hand, the necessary accessories and instruments for practical work on the subject, books of reference, documents as far as possible or *fac-simile* reproductions of inaccessible documents, charts, and models. Here the Professor and his Assistants work individually with the students, the true and living spirit of learning breathes in the place, and real knowledge is acquired and genuine ability to work at the subject.

This is the ideal type of work in an ideal university.

Before leaving this subject I would venture to offer a protest, without in the slightest depreciating the work of the teacher who is sometimes unfortunately engaged upon undergraduate teaching only, against the popular and erroneous view, that the teacher who is mainly or wholly employed in post-graduate or research teaching, is a kind of genus apart by himself who does no teaching work. The Professor in a University who instructs

students, who have already graduated, in more advanced work, who sets problems of a research nature for such students to attack, and who supervises and inspires their work, is doing teaching of the highest University standard, and most valuable for the reputation of any University.

We may now consider some specific points regarding the ordinary undergraduate teaching which have not yet been mentioned.

First, as to the level at which University work should commence, and as to the matriculation standard which should be required. Here a uniformity of standard is sadly lacking, and still more to be deplored is the absence or incompleteness of interchangeability of the matriculation examinations of different Universities.

In the interests both of secondary schools and Universities throughout the kingdom, some attempt should be made to solve this thorny and long deferred question.

The matriculation standard should be the same throughout the whole country, and a student who has passed the matriculation or entrance examination of one University ought to be able to enter any University in the country.

The common examination should be of one standard and be state-conducted throughout the country on the system of the school leaving examination of the German gymnasia.

It should not have the nature of a five-barred gate to prevent the student entering the precincts of the Universities, but should have a fair level in ordinary school subjects, and be in the nature of a guarantee that the student is sufficiently trained to benefit from the particular University curriculum he is about to undertake.

There should naturally be no competition between secondary school and University in preparing for this examination, but rather a good understanding between the two sets of bodies, whereby the schools agreed to attempt the level necessary for the Universities, and the Universities set their commencing work neither much above or below this level, so that there should be no undesirable overlap or hiatus between the two.

How this ideal state of affairs is to be brought about is difficult to say, but as far as mutual understanding among Universities as to equal standard of matriculation is concerned I feel certain that free trade is the only feasible solution. The University which, without waiting for any reciprocation could agree to accept any University matriculation in the country would score heavily. I know of no University in the country which possesses in my opinion too low a matriculation standard and I am inclined to believe that the difference between the different matriculation standards are matters of tweedledum and tweedledee.

The fear of being regarded as possessing the lowest standard of all has probably been the factor at work in preventing this solution, but I have yet to be convinced of the validity of this argument.

A free commerce of education and of students at a higher level than the matriculation is also desirable. A student in a German University can enjoy the freedom of passing from one University to another, and his work at one is accepted by another. There is none of that exclusiveness savouring of mean and petty rivalry which possesses the academic mind in this country, and so much encourages the anxious lay enquiry, especially in the parent's mind, "Can you tell me if University A is higher than University B?" or "Is the degree of C better than the degree of D?"

A feeling in favour of interchangeability is gradually growing, but the prejudices of University graduates themselves are so narrow in this respect that years must elapse before any practical result can be hoped for. Meanwhile the poor student who for any reason has to change his residence must beg and pray to faculties for recognition of examinations which should be his by right.

Next with regard to fees, and to assistance to students in the form of bursaries, scholarship, grants, fellowships, and such forms of assistance.

I am not in favour of entire abolition of fees because I believe the users of any public system or institution should pay for the privilege in accordance with their means, and I

think an entirely free University system would at present be too great a burden on the community.

But the payments should be arranged so as to give the greatest advantage to the community, and to derive the greatest advantage from the system or institution.

For example, it is right when we use the tramcar service that we should pay a penny or twopenny fare, but it would be intolerable if we had to pay as many shillings and the whole system would break down, it would not pay and would be of little or no service to the community.

Now University fees in this country are three to four times as expensive as in Germany and within our own country they are much higher in England than in Scotland or Ireland.

This forms an almost intolerable burden on the middle classes which are the chief users of the Universities at present, and narrows their utility and decreases the amount of service they can render to the community.

Take the case of a professional man or a fairly successful business man with an income lying say between £400 and £500 a year. Say he has three children to whom by dint of struggling he has given a good secondary school education, and he desires to send them to a University, fees alone in each case will amount to £25 to £30 and when maintenance is added each will cost, even living at home, from £60 to £70 a a year.

The task is almost impossible. He may, it is true, be allowed on grounds of his means being limited, under certain conditions, certain remissions of fees; but surely as in Germany he ought to be able to give his children a University education on reasonable terms as a right from the State and not as a favour because he is poor.

How does the German manage to do it, and why do we find it impossible; for the increased expense to the nation when once the machinery is there is very inconsiderable!

The reply is that State support is not adequate for University needs, and the fee system still forms the bed-rock of their finance. To reduce fees without increased support would mean

inefficience in the Universities, but the problem is an important national one which must some time be attacked and settled.

Regarding University bursaries, exhibitions and scholarships, I do not think these should ever be given on grounds of poverty only, for that alone constitutes no claim on the community for a University education.

Scholarships, both for fees and maintenance should fall to those who are likely afterwards to do service of some distinction to the community.

Further, the eleemosynary principle in connection with scholarships is most debasing. A student who has competed for and won an honour in the shape of a scholarship (for an honour it should be and not a benefaction) should feel an honest pride in the result and not that he has been given an alms to help him to an education.

A student should show more than mediocrity before he had the honour of a University scholarship, and then he should have something substantial to cover both fees and maintenance not as a boon from the community but as a reward for good work and encouragement to further effort.

It is a mistake to suppose that payment of fees alone is all that is needed to open a University Career to the poor but brilliant student.

Free fees alone to a poor lad at a Board School who has out-shone all his competitors, may be a very cup of Tantalus, for where is he to obtain food and clothing in his University years?

I feel certain that the magnificent benefaction with which in recent years Mr. Carnegie has enriched the Scottish Universities would have been far better arranged if instead of providing free fees alone for every Scottish youth, he had provided free University education, which is quite another matter, for one-tenth of the number. Instead of dispensing charity spread out too thin, let University benefactors in future think more of picking out, rewarding, and preserving for the country's service conspicuous intellectual ability.

Too often have I been saddened by the sight of a lad of brilliant ability, who had won free fees or small scholarships

sufficient to meet them, but had not the wherewithal to live, driven to go and earn the necessary money at his best and most receptive age for University work, and coming back tired by over-work to start a year behind his former classmates.

With regard to the scope of a University's work this should be cast as broad as amounts of endowment will enable it to be performed adequately and well. For example, it is to my thinking a great pity that higher work in both the practical and critical aspects of music, painting, sculpture, and the drama should be so far removed from the work of our Universities. Every true lover of Art, ought to desire to see a free school of these on the lines of the University teaching I have outlined above, living alongside the other arts and sciences which are more frequently found within University walls.

But here we are tightly bound by the question of ways and means, and it is better to do a few things well than many things badly.

It is better for a University to hold the premier position for a few things throughout the civilized world than only to enjoy the unenviable position of mediocrity in all.

Let us in our ideal University take the position of building each of our schools free and powerful as we go, ever extending by a process of organic growth, and ever widening in our growth, but do not let us build feeble institutions only partially endowed and capable of no strong vigorous work. Preserving also that independence and freedom of work which I have previously insisted upon, let us in our growth keep an eye upon the special requirements of the district in which we are situated. Every class, every profession, every set of interests in the community which can be benefitted by the University ought to be benefitted by the University. All sense of narrow University feeling should be lost, and it should be recognized that there is no class of work too high for a University or too low for a University, that the University's organization enables it to do well.

Turning now to the research side of University work there are many aspects that might be dwelt upon, such as the practical advantage of applied science, the need of increased endowment for technical research to enable us to face foreign competition,

the need for medical research against disease in the interests of humanity, etc., but my time is limited and I choose to put what I have to say into some examples of the advantages of free unfettered reseach in unapplied science and knowledge in general.

If I had space I should like to commence with a whole essay upon the subject of "What is Utility, and who is the true Utilitarian?" but I must hold myself well in hand and will content myself with one concrete example.

Eveyone who has sailed up the Mersey recently or crossed from Woodside to the Landing Stage, must have been struck with the beauty and grandeur of proportion of the new Mersey Docks and Harbour Board Offices. The building is a thing of beauty which fills us with a sense of pride in the Corporation which could build it, and its beauty for generations will delight the eyes and gladden the minds of dwellers in these parts. But as far as mere narrow utility goes, a great oblong box of a building would have done as well, the office work within could have been done as well, and the lighting would have been as good inside, though the exterior might have been hideous.

Yet who is he who regrets the erection of the noble building or sees not its utility to the man of education and taste in the sense of pleasure that the prospect of it ever brings!

Our definition of utility must vary with the range of our intellectual vision, and the utility of the civilized man is not that of the savage or barbarian.

I want my appeal however to reach not only the literary and scientific ear, but to touch the practical man in the street who has perhaps no time, poor man, to think of or admire the utility of the beautiful.

Perhaps he appreciates the advantages of telephones, and electric tubes, and electric tramcars, and electric light for his office and his villa in the evening, and the following tale may appeal to him.

About fifty years ago, or thereabouts, an elderly gentleman with long white hair unevenly parted in the middle and thrown carelessly to each side, and with side whiskers as was the fashion

of the time, a benevolent looking old man with a kindly smile on his broad face and a bright but serious look in his wide apart eyes, was apparently amusing himself with some odd pieces of electrical apparatus. He did not look like one who was bent upon doing anything very practical, but evidently took pleasure in what he was about. He had amongst his apparatus a coil attached to a galvanometer and noticed when a magnet which he held in his hand was brought near the coil that there was a deflection of the magnetic needle of the galvanometer. The effect pleased him greatly and he began further work upon it, he happened to be a lecturer at an institution where evening lectures were given and he showed the curious effect there, and also that if he had one coil of wire with an electric current flowing in it and brought this near another circuit with a coil in it so that the two coils were brought near together then just as the first coil was brought up or taken away there was a a momentary current, induced as he called it, in the second coil although no battery or other source of electricity was attached to it. Also if he left the two coils together and opened or broke the current in the one coil just as you might switch on or off an electric light, then just at the instant of switching either on or off the current there was, but only for that instant, a current in the other coil.

It seemed a curious sympathy between the two coils, an odd isolated interesting fact of little or no possible service to humanity. One can almost hear the practical people coming away from the lecture saying "what a fascinating man "Mr. Faraday is, and what an interesting lecturer, what curious "experiments, but do you know I cannot see much good in it "all, I wish he would turn his attention to something practical."

Yet even Faraday himself in a few years showed the practical uses of induced currents, and now almost every practical application of electricity in our day is based on that discovery.

Let us take a second electrical discovery by a young German savant, Hertz, who was cut off from his work all too young to see its glorious consummation.

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He discovered that if you made a simple ring of wire with a gap in it and two knobs at the ends of the gap, with a little space between them, and if you held this near an electric machine discharging through Leyden jars, then occasionally you got a spark between the two knobs and occasionally you did not.

There was a great discovery! was it not? why it almost makes the practical man laugh to think of scientists wasting their time on such trifles.

But hold, that was the real discovery of wireless telegraphy, the germ of the whole thing.

By the amplification of the Hertzian electric wave experiments by others, notably by Sir Oliver Lodge, the way was paved for Marconi's practical work.

Let us conclude with an example from the domain of Biology applied to Medicine.

Some years ago there was a long, and it must be admitted, rather acrimonious dispute as to whether certain very tiny living bodies which could only be seen through a microscope, and were called therefore micro-organisms, could be produced spontaneously in the media, sometimes very unsavoury media, in which they were found to flourish.

Some philosophers said they could arise without any parents, while others maintained that they needed parents almost as much as we do ourselves.

Not only so, but the one set of philosophers carried out many and extensive experiments which conclusively proved to their way of thinking that these organisms did spontaneously arise, and the other set did experiments which as equally proved to them that unless a parent germ was there no organisms ever arose.

So the acrimonious dispute went on and volumes were written about it on both sides. Does it not seem a trifling matter for great philosophers to waste their time upon, whether these organisms found in such conditions had parents or not, and what possible issue could there be of practical moment to such enquiries?

Let me tell you what came of it, no less than practically the whole subject of modern bacteriology, the saving of hundreds of thousands of human and animal lives, all the glorious possibilites and brilliant achievements of modern surgery—and if it be more interesting to the practical man, all the canned meats of the world.

A lot you may say to come out of a pother about whether these miserable micro-organisms had progenitors or were spontaneously created.

The question was mainly settled by Louis Pasteur, by a thorough study of the micro-organisms and the general conditions under which they lived. He found how they could be killed, or as we put it now how sterilization could be effected, and that when once sterilized and not recontaminated growth was impossible.

The practical application to surgery which has made possible and safe, operations which before could never have been contemplated, is due to the genius of our own great surgeon, Lord Lister, who applied Pasteur's principles to operative surgery and fought the battle of antisepsis for a generation, till all the world was convinced of its mighty and saving truth.

By this fundamental discovery, the possibility of making pure sterile culture media for different disease germs to grow in was also established, and now the germs of many diseases could be separated and grown into pure races of the one germ only, which could be studied apart, and not as before only along with many other races so that no man might be certain which was the causative agent of any disease.

In the generation that followed, an army of workers were at work on developments, directly or indirectly, of that one fast proven fact of science, which, at least to the uninitiated eye, at first showed no chance of anything of practical profit.

May we not on such examples, which might be multiplied by the score, base a hopeful plea for the encouragement and the endowment of untrammelled and unapplied scientific philosophy?

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